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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,071	06/24/2003	Frederick G. Walther	0050.2055-001	8598

21005 7590 10/27/2008

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EXAMINER	
LIU, LI	

ART UNIT	PAPER NUMBER
2613	

MAIL DATE	DELIVERY MODE
10/27/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/603,071	WALTHER ET AL.	
	Examiner	**Art Unit**	
	LI LIU	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,11,26,27,29-36,39,54-83,85-99,101-115,117 and 118* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *87-97 and 103-113* is/are allowed.

6)☒ Claim(s) *1-8,11,26,27,29-36,39,54-67,79-83,85,86,98,99,101,102,114,115,117 and 118* is/are rejected.

7)☒ Claim(s) *68-78* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 February 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species 1 in the reply filed on 7/10/2008 is acknowledged. No claims are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

2. The applicant has states that Claims 2-6, 11, 26, 27, 29-34, 39, 54-63, 65-70, 79-83, 85-89, 98, 99, 101, 102, 114, 115, 117 and 118 are also generic and include the embodiments of both Species 1 and Species 2. However, the claims 68-70 and 87-89 are not generic and do not include embodiments of Species 2. As cited in claim 68, "the means for deflecting in the first stack being means for reflecting", and in claim 87, "the deflectors in the stack being reflectors", that is, the claims 68-70 and 87-89 belong to the Species 1: the reflection-mode bandpass filter approach.

Response to Arguments

3. Applicant's arguments filed on 2/13/2008 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 101, 102, 114 and 115 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

1). The claims 101, and depending claim 102, recite the limitations: passing of electromagnetic signals by an aperture structure; splitting the electromagnetic signals into first and second electromagnetic signals; ... and deflecting second respective electromagnetic signals passing through the aperture structure at respective angles using a second stack of deflectors. However, according the original disclosure, the electromagnetic signals passing through the aperture (e.g., 103 from outside the device, Figure 6) are split into first (e.g., 104 in Figure 6) and second (e.g., 105 in Figure 6) electromagnetic signals (the PBS splits the signals), and the two signals then pass through respective polarization rotation devices, deflectors and the PBS again, and then received by respective receiving devices (reception paths 110 and 112 in Figure 6). The original disclosure does not disclose that the deflectors deflect the second electromagnetic signals, which are split from the electromagnetic signals passing through the aperture, to pass through the aperture again. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

2). The claims 114, and depending claim 115, recite the limitations: passing of electromagnetic signal by an aperture structure; splitting the electromagnetic signals into first and second electromagnetic signals; and deflecting respective first electromagnetic signals of respective wavelengths at respective angles by a first stack of deflectors, and passing the first electromagnetic signals through the aperture structure. However, according the original disclosure, the electromagnetic signals passing through the aperture (e.g., 103 from outside the device, Figure 6) are split into first (e.g., 104 in Figure 6) and second (e.g., 105 in Figure 6) electromagnetic signals (the PBS splits the signals), and the two signals then pass through respective polarization rotation devices, deflectors and the PBS again, and then received by respective receiving devices (reception paths 110 and 112 in Figure 6). The original disclosure does not disclose to deflect and pass the first electromagnetic signals (which are split from the electromagnetic signals passing through the aperture) through the aperture again. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 85, 86, 98, 99 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap

between the elements. See MPEP § 2172.01. The omitted elements are: the polarization rotational devices.

The claims 85 and 98, and depending claims 86 and 99 recite the limitations: an aperture, a polarizing splitting element, a first stack of deflectors deflecting first respective electromagnetic signals, a second stack of deflectors deflecting second respective electromagnetic signals, and the first and second electromagnetic signals passing through the aperture.

In the original disclosure and the drawings (e.g., Figures 6-8, 13 and 14 of Species 1), the aperture and two stacks of deflectors are coupled by the polarization beam splitter (PBS) and two polarization rotational devices (the quarter wave plate QWP or Faraday Rotator FR in Figure 6-8, 13 and 14). And the polarization splitter splits the signal into two parts so that the each stack of deflector can deflect part of the signal; and the PBS is positioned "so that it is transparent to signals on 103 polarized along one direction, so that these signals travel along 104" (to the first stack of deflectors), and "reflects the signals with perpendicular polarization so that they travel along 105" (to the second stack of deflectors); and the polarization rotational devices QWP and FR are positioned "so that a signal for which the PBS 21 was transparent ends up being reflected on PBS, and vice versa" (page 9, line 24 to page 10 line 9). The polarization rotational devices (QWP or FR, shown in detail in Figures 1 and 2) are essential to the stacks of reflectors and the aperture (Figures 6-8, 13 and 14). Without the polarization rotational devices, the reflected signal cannot properly redirected to the aperture. That is, without the polarization rotational devices, the two split signals (the

first signals and second signals) cannot be recombined again and passed through the same aperture.

8. Claims 101, 102, 114 and 115 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: positioning polarization rotation devices between the polarization splitting device and the stacks of deflectors, and passing the split first and second electromagnetic signals through the polarization rotation devices, and after being deflected, then the first and second electromagnetic signals passing through the polarization rotation devices.

The claims 101 and 114, and depending claims 102 and 115, recite the limitations: passing of electromagnetic signal by an aperture; splitting the electromagnetic signals into first and second electromagnetic signals, deflecting first respective electromagnetic signals by a first stack of deflectors, deflecting second respective electromagnetic signals by a second stack of deflectors.

In the original disclosure and the drawings (e.g., Figures 6-8, 13 and 14 of Species 1), the aperture and two stacks of deflectors are coupled by the polarization beam splitter (PBS) and two polarization rotational devices (the quarter wave plate QWP or Faraday Rotator FR in Figure 6-8, 13 and 14). And the polarization splitter splits the signal into two parts so that the each stack of deflector can deflect part of the signal; and the PBS is positioned "so that it is transparent to signals on 103 polarized along one direction, so that these signals travel along 104" (to the first stack of deflectors), and "reflects the signals with perpendicular polarization so that they travel

along 105" (to the second stack of deflectors); and the polarization rotational devices QWP and FR are positioned "so that a signal for which the PBS 21 was transparent ends up being reflected on PBS, and vice versa" (page 9, line 24 to page 10 line 9). Since the deflectors are reflectors (Species 1), the polarization rotational devices are essential to the stacks of reflectors and the aperture. The method is used for communication (that is, for transmitting or receiving signals), when the method is for receiving signals, without the step of positioning the polarization rotational devices between the polarization splitting device and the stacks of deflectors and passing the electromagnetic signals through the polarization rotation devices twice, the reflected signals cannot properly be received, e.g., the reflected signals would be redirected towards the aperture again; when the method is for transmitting signals, without the step of positioning the polarization rotational devices between the polarization splitting device and the stacks of deflectors and passing the electromagnetic signals through the polarization rotation devices twice, the two split and reflected signals (the first signals and second signals) cannot be recombined again and passed through the same aperture.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

> applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1, 3, 27, 29, 31, 55, 57, 59, 83 and 117 and 118 are rejected under 35 U.S.C. 102(e) as being anticipated by Marom et al (US 6,657,770).

1). With regard to claim 1, Marom et al discloses a communication device (e.g., Figures 5 and 6) comprising:

an aperture structure (e.g., 530 in Figure 5 or 640 in Figure 6; or the combination of 520 and 530 in Figure 5); and

wavelength dependent deflectors (the micro mirror array 560 in Figure 5) deflecting respective electromagnetic signals of respective wavelengths (e.g., Figure 5, the micro mirror deflects individual wavelength channel, column 5, line 10-52) at different respective wavelength dependent angles (the angle of the mirror is dynamically controlled by a controller, e.g., control signal 58 in Figure 5) to dynamically and independently steer (control signal 58, column 5, line 53-65) the electromagnetic signals passing through the aperture structure in different wavelength dependent angular directions (Figure 5, each wavelength channel passes through the lens aperture in different wavelength dependent angular directions) to or from remote receiver or transmitter devices at different angular locations (relative to the center of the lens aperture, the output ports 570-1 to 570-k have different angular locations; and the device is used for WDM optical communications signal and fiber optic network, it is inherent that a remote receivers are connected to the output ports 570-1 to 570-k).

2). With regard to claim 3, Marom et al discloses wherein at least one of the deflectors is movable (Figure 5, the deflector 560 can be tilted, column 5, line 53-65).

3). With regard to claim 27, Marom et al discloses wherein the aperture structure is a telescope (the combination of 520 and 530 forms a telescope structure, Figure 5).

4). With regard to claim 29, Marom et al discloses a method for communication comprising:

passing electromagnetic signals through an aperture structure (e.g., 530 in Figure 5 or 640 in Figure 6; or the combination of 520 and 530 in Figure 5); and

deflecting respective electromagnetic signals of respective wavelengths at different respective angles (e.g., Figure 5, the micro mirror deflects individual wavelength channel, column 5, line 10-52, the angle of the mirror is dynamically controlled by a controller, e.g., control signal 58 in Figure 5), by wavelength dependent deflectors (the micro mirror array 560 in Figure 5) to dynamically and independently steer (control signal 58, column 5, line 53-65) the electromagnetic signals passing through the aperture structure in different wavelength dependent angular directions (Figure 5, each wavelength channel passes through the lens aperture in different wavelength dependent angular directions) to or from remote receiver or transmitter devices at different angular locations (relative to the center of the lens aperture, the output ports 570-1 to 570-k have different angular locations, and the device is used for optical communication system, it is inherent that a remote receivers are connected to the output ports 570-1 to 570-k).

5). With regard to claim 31, Marom et al discloses wherein at least one of the deflectors is movable (Figure 5, the deflector 560 can be tilted, column 5, line 53-65).

6). With regard to claim 55, Marom et al discloses wherein the aperture structure is a telescope (the combination of 520 and 530 forms a telescope structure, Figure 5).

7). With regard to claim 57, Marom et al discloses a communication device (e.g., Figures 5 and 6) comprising:

aperture means (e.g., 530 in Figure 5 or 640 in Figure 6; or the combination of 520 and 530 in Figure 5); and

means (the micro mirror array 560 in Figure 5) for wavelength dependent deflecting of respective wavelength division multiplexing electromagnetic signals (e.g., Figure 5, the micro mirror deflect individual wavelength channel, column 5, line 10-52, the signal from the input port 510 in wavelength division multiplexing electromagnetic signals) of respective wavelengths at different respective angles (the angle of the mirror is dynamically controlled by a controller, e.g., control signal 58 in Figure 5) to dynamically and independently steer (control signal 58, column 5, line 53-65) the electromagnetic signals passing through the aperture means in different wavelength dependent angular directions) to or from remote receiver or transmitter devices at different angular locations (relative to the center of the lens aperture, the output ports 570-1 to 570-k have different angular locations, and the device is used for optical communication system, it is inherent that a remote receivers are connected to the output ports 570-1 to 570-k).

8). With regard to claim 59, Marom et al discloses wherein at least one of the means for deflecting is movable (Figure 5, the deflector 560 can be tilted, column 5, line 53-65).

9). With regard to claim 83, Marom et al discloses wherein the aperture means is a telescope (the combination of 520 and 530 forms a telescope structure, Figure 5).

10). With regard to claim 117 and 118, Marom et al discloses wherein the device or method transmits and/or receives wavelength division multiplexing electromagnetic signals (the signal from the input port 510 is wavelength division multiplexing electromagnetic signals).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claim 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riley et al (US 6,763,149) in view of Rockewell (US 6,327,063).

Reiley et al discloses a method for deflecting electromagnetic waves comprising:

independently deflecting electromagnetic waves within a first wavelength band at a first angle (Figure 29, e.g., the deflector 266 deflects electromagnetic wave within a first wavelength band “Red” at a specific angle. Each deflector has different angle) and passing electromagnetic waves within a second wavelength band by a first deflector

(e.g., the deflector 266 passes electromagnetic waves within a second wavelength band "Yellow" or "Green" or "Blue"); and

independently deflecting electromagnetic waves within a second wavelength band, at a second angle independent of the first angle (Figure 29, e.g., the deflector 268 deflects electromagnetic wave within a second wavelength band "Yellow" at a specific angle, each filter 266-270 is oriented independently), by a second deflector (Figure 29, the deflector 268 deflects electromagnetic waves within a second wavelength band "Yellow"), the second deflector positioned to receive the electromagnetic waves passed through the first deflector (the deflector 268 receives the electromagnetic waves "Yellow" or "Green" or "Blue" passed through the first deflector).

But, Riley et al does not expressly state that the first and second angles of the deflectors are "dynamic" angles.

However, Riley et al also discloses "the angles or orientation of the filters may be adjusted to direct light of a given bandwidth onto any desired point on the TDI detector" (column 31 line 12-15); that is the system of Riley et al is fully capable of dynamically deflecting the respective electromagnetic signals of respective wavelengths.

Another prior art, Rockwell, teaches a device in which the deflectors (e.g., the mirrors 62 and 66) can be dynamically adjusted, or deflect electromagnetic waves at a dynamic angle "for acquisition, tracking, and communications alignment purposes" (column 7 line 57 to column 8 line 21). By dynamically control, the device can accurately follow the movement of the target (e.g., when the object 22 or 24 is moving in the plot plane, up and down, the dynamically controlled filters 266-270 can be adjusted to

accurately direct lights to the desired points on the detectors). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the dynamically controlling as taught by Rockwell to the system of Riley et al so that the system can accurately track the movements of the targets.

13. Claims 1, 3-8, 11, 26, 27, 29, 31-36, 39, 54, 55, 57, 59-65, 67, 79, 80, 82, 83, 117 and 118 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rockewell (US 6,327,063) in view of Sakanaka (US 7,058,307) and Riley et al (US 6,763,149).

1). With regard to claims 1, 29 and 57, Rockewell discloses a device and method for communication (Figure 2) comprising:

an aperture structure (the telescope 64 in Figure 2, for passing electromagnetic signals); and

deflector (the mirror 62 in Figure 2, or the mirror 62 and 66 combination) deflecting respective electromagnetic signals at different angles (Figure 2, the mirror 62 is rotated to fine tune the signal beams, column 7 line 57 to column 8 line 21) to dynamically and independently steer the electromagnetic signals passing through the aperture structure (the signals λ_T and λ_R is steered to passing through the aperture structure) in different angular directions to or from remote receiver or transmitter devices at different angular locations (column 7 line 57 to column 8 line 21).

But, Rockewell does not disclose that the deflector is wavelength dependent, and the deflectors deflect respective electromagnetic signals of respective wavelengths at different respective wavelength dependent angles and steer the electromagnetic signals

passing through the aperture structure in different wavelength dependent angular directions.

Sakanaka, in the same field of endeavor, discloses a deflector (the mirror 23 in Figure 1) that can dynamically deflect different signals from different transceivers at different angles (11a, 11b and 11c in Figure 1, column 4, line 31-61); and the base system 10 in Figure 1 can transmit and receive to and from only one remote device at a time.

However, another prior art, Riley et al, discloses a stack of wavelength dependent deflectors (266, 268, 270 and 272 in Figure 29, and 103 in Figure 1B), and the deflectors deflect respective electromagnetic signals of respective wavelengths (e.g., the RED, YELLOW, GREEN and BLUE) at different respective wavelength dependent angles (Figure 29, each deflector has different deflecting angle). And the deflectors can steer the electromagnetic signals passing through the lens aperture 40 in different wavelength dependent angular directions. And Riley et al also discloses "the angles or orientation of the filters may be <u>adjusted</u> to direct light of a given bandwidth onto any desired point on the TDI detector" (column 31 line 12-15); that is the system of Riley et al is fully capable of dynamically deflecting the respective electromagnetic signals of respective wavelengths.

Sakanaka teaches to communicate with different remote devices through one deflector, Riley et al teaches a stack of wavelength dependent deflectors, the combination of Sakanaka and Riley et al can make the device of Sakanaka to communicate with multiple devices at the same time, and steer the electromagnetic

signals passing through the aperture structure in different wavelength dependent angular directions. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflector and wavelength dependent deflecting as taught by Sakanaka and Riley to the system of Rockewell so that the system can transmit and receive to and from multiple remote devices (transmitters or receivers at different angular locations) at a time and the system capacity can be substantially increased.

2). With regard to claims 3, 31 and 59, Rockewell and Sakanaka and Riley et al disclose all of the subject matter as applied to claims 1, 29 and 57 above. And Rockwell and Sakanaka and Riley et al further disclose wherein at least one of the deflectors is movable (e.g., 62 in Figure 2 of Rockwell, and 24 in Figure 1 of Sakanaka).

3). With regard to claims 4, 32 and 60, Rockewell and Sakanaka and Riley et al disclose all of the subject matter as applied to claims 1, 29 and 57 above. And Rockwell and Sakanaka and Riley et al further disclose wherein the deflectors form a first stack, a deflector in the first stack passing a signal deflected by another deflector in the first stack (Figure 29 of Riley et al, the deflectors 266, 268, 270 and 272 form a stack; and a deflector, e.g., 270, passes a signal, e.g. "BLUE" deflected by another deflector, e.g., deflector 272).

4). With regard to claims 5, 33 and 61, Rockewell and Sakanaka and Riley et al disclose all of the subject matter as applied to claims 1, 4, 29, 32, 57 and 60 above. And Rockwell and Sakanaka and Riley et al further disclose wherein at least one deflector in the first stack deflects substantially all signals within a wavelength band (Figure 29 of

Riley et al, the deflectors 266, 268, 270 and 272 form a stack; and the deflector 272 deflect all signals within a wavelength band “BLUE”).

5). With regard to claims 6, 34 and 62, Rockewell and Sakanaka and Riley et al disclose all of the subject matter as applied to claims 1, 4, 5, 29, 32, 33, 57, 60 and 61 above. And Rockwell and Sakanaka and Riley et al further disclose wherein individual deflectors in the first stack deflect substantially all signals each within its respective non-overlapping wavelength band (Figure 29 of Riley et al, e.g., the deflector 266 deflect substantially all signals each within its respective non-overlapping wavelength band “RED”, and the deflector 270 deflect substantially all signals each within its respective non-overlapping wavelength band “GREEN”) and pass signals deflected by other deflectors in the first stack (Figure 29 of Riley et al, e.g., the deflector 266 pass signals “YELLOW”, GREEN” and “BLUE” deflected by other deflectors in the first stack).

6). With regard to claims 7, 35 and 63, Rockewell and Sakanaka and Riley et al disclose all of the subject matter as applied to claims 1, 4-6, 29, 32-34, 57 and 60-62 above. And Rockwell and Sakanaka and Riley et al further disclose wherein at least one of the deflectors in the first stack is movable (e.g., 62 in Figure 2 of Rockwell, and 24 in Figure 1 of Sakanaka).

Although Rockewell and Sakanaka and Riley et al don’t specifically disclose to reflect signals at nearly normal incidence, such limitation are merely a matter of design choice and would have been obvious in the system of Rockewell and Sakanaka and Riley et al. Rockewell and Sakanaka and Riley et al teach reflecting different signal at different angles. The limitations in claims 7, 35 and 63 do not define a patentably

distinct invention over that in Rockewell and Sakanaka and Riley et al since both the invention as a whole and Rockewell and Sakanaka and Riley et al are directed to wavelength dependent deflectors. The reflecting angles are determined by the positions of the remote device and the transceiver at the base system. Therefore, to reflect signals at nearly normal incidence in Rockewell and Sakanaka and Riley et al would have been a matter of obvious design choice to one of ordinary skill in the art.

7). With regard to claims 8, 36 and 64, Rockewell and Sakanaka and Riley et al disclose all of the subject matter as applied to claims 1, 4-6, 29, 32-34, 57 and 60-62 above. And Rockwell and Sakanaka and Riley et al further disclose wherein the deflectors in the first stack are reflectors (Figure 29 of Riley et al andFigure 2 of Rockwell, the deflectors are reflectors).

8). With regard to claims 11, 39 and 67, Rockewell and Sakanaka and Riley et al disclose all of the subject matter as applied to claims 1, 4, 29, 32, 57 and 60 above. And Rockwell and Sakanaka and Riley et al further disclose wherein individual deflectors in the first stack pass signals deflected by other deflectors in the first stack (Figure 29 of Riley et al, e.g., the deflector 266 pass signals "YELLOW", GREEN" and "BLUE" deflected by other deflectors in the first stack).

9). With regard to claims 26, 54 and 82, Rockewell and Sakanaka and Riley et al disclose all of the subject matter as applied to claims 1, 29 and 57 above. And Rockwell and Sakanaka and Riley et al further disclose wherein electromagnetic signals deflected by at least one of the deflectors carry communications transmitted by the device and communications received by the device (Figures 1 and 2 of Rockwell, the

electromagnetic signals λ_T and λ_R deflected the deflector 62 carry communications transmitted λ_T by the device and communications received λ_R by the device).

10). With regard to claims 27, 55 and 83, Rockewell and Sakanaka and Riley et al disclose all of the subject matter as applied to claims 1, 29 and 57 above. And Rockwell and Sakanaka and Riley et al further disclose wherein the aperture structure is a telescope (the telescope 64 in Figure 2 of Rockwell).

11). With regard to claims 65, 79, Rockewell and Sakanaka and Riley et al disclose all of the subject matter as applied to claims 57 and 60-62 above. And Rockwell and Sakanaka and Riley et al disclose a first stack of deflectors for deflecting respective electromagnetic signals (e.g., 62 in Figure 2 of Rockwell, and 24 in Figure 1 of Sakanaka) passing through the aperture structure at respective angles, individual means for deflecting in the first stack deflecting substantially all signals each within its respective non-overlapping wavelength band (Figure 29 of Riley et al, the deflectors 266, 268, 270 and 272 form a stack; and the deflector 272 deflect all signals within a wavelength band “BLUE”) and passing signals deflected by other means for deflecting in the second stack. (Figure 29 of Riley et al, a deflector, e.g., 270, passes a signal, e.g. “BLUE” deflected by another deflector, e.g., deflector 272).

But, Rockewell and Sakanaka and Riley et al does not teach a second stack of means for deflecting respective electromagnetic signals passing through the aperture structure at respective angles, individual means for deflecting in the second stack deflecting substantially all signals each within its respective non-overlapping wavelength band and passing signals deflected by other means for deflecting in the second stack.

Since Rockewell and Sakanaka and Riley et al teach a stack of deflectors, at the time of the invention, it would have been obvious to a person of ordingary skill in the art to incorporate in sytem disclosed by Rockewell and Sakanaka and Riley et al a second stack of deflectors. The suggestion/motivation for doing so would have been to further increase the system capacity. Claim 65 is not patentable different from the Rockewell and Sakanaka and Riley et al, because it is “to duplicate a part for a multiple effect” (see St. Regis Paper Company v. Bemis Company, Inc., 193 USPQ 8 (CA 7 1977) “It is difficult to conceive of a more obvious method of strengthening a certain type of bag than putting one bag inside of another.”).

12). With regard to claim 80, Rockewell and Sakanaka and Riley et al disclose all of the subject matter as applied to claims 57, 60 and 79 above. And Rockwell and Sakanaka and Riley et al further disclose wherein individual means for deflecting in a stack pass signals deflected by other means for deflecting in a stack (e.g., Figure 29 of Riley et al, the deflectors 266, 268, 270 and 272 form a stack; and a deflector, e.g., 270, passes a signal, e.g. “BLUE” deflected by another deflector, e.g., deflector 272).

13). With regard to claims 117 and 118, Rockewell and Sakanaka and Riley et al disclose all of the subject matter as applied to claims 1 and 29 above. And Rockwell and Sakanaka and Riley et al further disclose wherein the device or method transmits and/or receives wavelength division multiplexing electromagnetic signals (Figure 2 of Rockwell, e.g., the λ_T is a wavelength division multiplexed optical signal comprising λ_1 and λ_2).

14. Claims 2, 30, 58 and 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rockewell (US 6,327,063) and Sakanaka (US 7,058,307) and Riley et al (US 6,763,149) as applied to claims 1, 29 and 57 above, and in further view of Rice (US 5,347,387).

1). With regard to claims 2, 30 and 58, Rockewell and Sakanaka and Riley et al disclose all of the subject matter as applied to claims 1, 29 and 57 above. And Rockwell further disclose an aperture linear/circular polarization device (the Polarization Changer 56 in Figure 2) after the deflector (mirror 62). But, the linear/circular polarization device in Rockwell's system is not between at least one of the deflectors and the aperture structure.

However, the polarization changer (56 in Figure 2) can be put between the mirror 62 and the telescope 54. Rice et al discloses such a polarization beam rotator (16 in Figure 1) that is between one of the deflectors (converging mirror) and the aperture structure (14 and 15 in Figure 1).

By putting the polarization beam rotator, the signals with different polarizations can be separated by the following polarization beam splitter. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the polarization rotator as taught by Rice to the system of Rockwell and Sakanaka and Riley et al so that the system can transmit and receive signal with different polarizations and the system capacity can be substantially increased.

2). With regard to claim 81, Rockewell and Sakanaka and Riley et al disclose all of the subject matter as applied to claims 57, 60 and 79 above. And Rockwell discloses

a polarization beam splitter (54 in Figure 2). But Rockewell and Sakanaka and Riley et al does not disclose the polarization beam splitter coupled to the first stack, second stack, and the aperture means.

However, Rice discloses a polarization beam splitter (17 in Figuer 1) coupled to the reflector (Mirror 20 in Figure 1) and the aperture (14 and 15 in Figure 1). The combination of Rockewell and Sakanaka and Riley et al disclose an aperture and two stacks of deflectors, therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the polarization beam splitter as taught by Rice to the system of Rockewell and Sakanaka and Riley et al so that the beam splitter can couple the first stack, second stack, and the aperture, and then system can transmit and receive to and from multiple remote devices at a time and the system capacity can be substantially increased by using the polarization multiplexed signals.

15. Claim 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rockewell (US 6,327,063) and Sakanaka (US 7,058,307) and Riley et al (US 6,763,149) as applied to claims 57, 60-62 and 65 above, and in further view of Huang et al (US 6,643,064).

Rockewell and Sakanaka and Riley et al disclose all of the subject matter as applied to claims 57, 60-62 and 65 above. But Rockwell and Sakanaka and Riley et al do not disclose wherein at least one second stack deflectors' wavelength band is located between two first stack deflectors' wavelength bands and at least one first stack deflectors' wavelength band is located between two second stack deflectors' wavelength bands.

However, to interleave two set of signals is well known and a common practice in the art. Huang et al discloses a system and method (Figure 1) to separate two sets of signals with different polarizations (Figure 1, e.g., the signal 1, 3, 5 etc. have one polarization and signals 2,4 and 6 etc have another polarization), and the wavelength band of each signal in set 200 is between two wavelength bands of two signals in the second set of signal 300.

Huang et al discloses a system and method that can decrease the interval between adjacent channels and thus increase the total transmission capacity under the existing network structure using the optical signal interleaver comprised of a polarization beam splitter/combiner, a polarization rotator, a polarization beam displacer, and a beam angle deflector, the incident beam output from an optical fiber collimator (the light signal with all wavelengths) can be separated into an O-ray and an E-ray, which then enter two ports of a double optical fiber collimator; and then the interference between the adjacent channels is decreased; and thus, the system can increase the total transmission capacity under the current network structure.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the wavelength interleaving method as taught by Huang et al to the system of Rockwell and Sakanaka and Riley et al so that one second stack deflectors' wavelength band is located between two first stack deflectors' wavelength bands and one first stack deflectors' wavelength band is located between two second stack deflectors' wavelength bands and then the system can transmit and

receive signal with different polarizations and the system capacity can be substantially increased.

Allowable Subject Matter

16. The previous indicated allowability of claims 85, 86, 98, 99, 101, 102, 114 and 115 are withdrawn in view of the new ground(s) of rejection.

17. Claims 68-78 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18. Claims 87-97, 103-113 are allowed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LI LIU whose telephone number is (571)270-1084. The examiner can normally be reached on Mon-Fri, 8:00 am - 5:30 pm, alternating Fri off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. L./
Examiner, Art Unit 2613
October 18, 2008

/Kenneth N Vanderpuye/
Supervisory Patent Examiner, Art Unit 2613